

Appl. No. 09/743,644

Reply to Office Action of March 31, 2003

LISTING OF CLAIMS

This listing of claims replaces all prior versions and listings of claims in the patent application.

Claim 1 (currently amended): A surface treatment apparatus for generating plasma by plasma generating electrodes in a casing having plasma generating electrodes, a raw-gas inlet and a substrate supporting table, plasma ionizing the raw gas and plasma processing a surface of said substrate, which is mounted on said substrate supporting table; wherein

said casing is partitioned to two chambers, that is, a plasma generating chamber provided with said plasma generating electrodes and a substrate processing chamber provided with said substrate supporting table, one of the plasma generating electrodes separates the plasma generating chamber from the substrate processing chamber;

said substrate processing chamber communicates with said plasma generating chamber through at least one plasma vent which is formed at said one of the plasma generating electrodes; and

the electrodes, which are disposed so as to interpose a plasma flow spurted out from the plasma vent therebetween for not disturbing the plasma flow, are provided in and between the vicinity of said plasma vent and the vicinity of said substrate supporting table.

Claim 2 (withdrawn): A surface treatment apparatus for generating plasma by plasma generating electrodes in a casing having plasma generating electrodes, a raw-gas inlet and a substrate supporting table, plasma ionizing the raw gas and plasma processing a surface of said substrate, which is mounted on said substrate supporting table; characterized in that

said casing is partitioned to two chambers, that is, a plasma generating chamber provided with said plasma generating electrodes and a substrate processing chamber provided with said substrate supporting table;

said substrate processing chamber communicates with said plasma generating chamber through at least one plasma vent; and

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a magnetic field, in which a line of magnetic force acts in a direction orthogonal to a plasma flow, is provided in at least a part between the vicinity of said plasma vent and the vicinity of said substrate supporting table.

Claim 3 (withdrawn): A surface treatment apparatus for generating plasma by plasma generating electrodes in a casing having plasma generating electrodes, a raw-gas inlet and a substrate supporting table, plasma ionizing the raw gas and plasma processing a surface of said substrate, which is mounted on said substrate supporting table; characterized in that

said casing is partitioned to two chambers, that is, a plasma generating chamber provided with said plasma generating electrodes and a substrate processing chamber provided with said substrate supporting table;

said substrate processing chamber communicates with said plasma generating chamber through at least one plasma vent; and

a conductive member, to which electric voltage is applied, is provided at a part of said plasma vent.

Claim 4 (withdrawn): A surface treatment apparatus according to claim 3, wherein said conductive member comprises a mesh-shaped or a grid-shaped conductive sheet.

Claim 5 (previously presented): A surface treatment apparatus according to claim 1, wherein high frequency electric power is inputted to said plasma generating electrodes.

Claim 6 (cancelled)

Claim 7 (previously presented): A surface treatment apparatus according to claim 1, wherein said plasma vent has a required orifice shape or a nozzle shape.

Claim 8 (previously presented): A surface treatment apparatus according to claim 1, wherein said raw-gas inlet defines an opening on a side face of said plasma vent.

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Claim 9 (withdrawn): A surface treatment apparatus according to claim 2, wherein said magnetic field is provided at said plasma vent.

Claim 10 (previously presented): A surface treatment apparatus according to claim 1, wherein said plasma vent has a circular section.

Claim 11 (previously presented): A surface treatment apparatus according to claim 1, wherein said plasma vent has a slit shape.

Claim 12 (previously presented): A surface treatment apparatus according to claim 1, wherein said substrate is given with electric potential.